

LOCAL AND TOLL SELECTORS

OPERATION TESTS

USING TEST SET SD-90210-01 (J34704A) OR SD-90416-01 (J94704A)

STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section describes a method of testing local and toll selectors in 350A step-by-step offices and 360A community dial offices, using test set SD-90210-01 (J34704A) or SD-90416-01 (J94704A).

1.02 This section is reissued to change the title and add the following: provisions for testing toll selectors; provisions for testing restricted service and class-of-service features on selectors; and information pertaining to the source of dial tone in common control or TOUCH-TONE equipped offices. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The tests covered are:

A. Local Selectors: This test checks the following selector features: vertical stepping to proper level and rotating to idle terminal; blocking; digit absorbing; cut-through; release; interrupted tone on blocked levels; and dial tone on first selectors not associated with common control or TOUCH-TONE.

B. Toll Selectors Using Test Set SD-90210-01:

This test checks the vertical stepping to proper level and rotating to idle terminal feature. It also checks blocking, interrupted tone on blocked levels, digit absorbing, cut-through, and release features of selector.

C. Toll Selectors Using Test Set SD-90416-01:

This test checks the same features as Test B using test set SD-90416-01.

D. Restricted Service and Class-of-Service Indication Features: This test checks

that a selector will rotate past any idle terminal on levels arranged for restricted service

and return interrupted tone. It also checks that a selector can receive restricted service or class-of-service condition from preceding circuit or extend same to succeeding circuit.

1.04 A different level (except levels with trunks to switchboard positions) should be used each time the tests are performed so that eventually every selector will have been tested on each working level.

1.05 On alternate tests, the first trunk should be made busy on the level under test in Tests A and B. On the other tests, the first trunk should be left idle to test that the selector does not overstep during rotary hunting.

1.06 The term "blocking" is applied to switches that either do not cut in when the level dialed is reached and return interrupted tone or, if arranged to cut in, will rotate to the eleventh rotary position and return interrupted tone.

1.07 When testing an incoming selector, the trunk should be made busy at the originating end in the approved manner for the duration of the test. It will be necessary to insert a make-busy plug into the test jack of the associated trunk circuit.

1.08 The test equipment specified in this section is designed to apply proper marginal tests (simulated critical circuit conditions) when the circuit under test and the test equipment have an applied voltage of 48.5 to 50. In those offices where power plants are normally operated at more than 50 volts, the battery voltage should be reduced and maintained within the required limits while the tests are being performed.

1.09 In offices arranged for common control or TOUCH-TONE, the associated first selectors will not supply dial tone. This function will

SECTION 226-305-503

be performed by the originating register or converter circuits.

1.10 Lettered Steps: A letter a, b, c, etc, added to a step number in Part 4 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

1.11 Local instructions should be followed for recording and reporting any register operations caused by performing these tests.

2. APPARATUS

2.01 The apparatus required for each test is shown in Table A. The details of each item are covered in the paragraph indicated by the number in parentheses.

2.02 Test set J34704A (SD-90210-01).

2.03 Test set J94704A (SD-90416-01).

2.04 1011G handset (dial hand test set) or equivalent, equipped with a 2W39A cord assembly consisting of a W2CL cord, a 471A jack, and a 240A plug. The KS-8011 switch on the cord in the OFF position cuts in 1200 ohms resistance.

2.05 Head telephone set.

2.06 Patching cord, P3K cord, 6 feet long, equipped with two 310 plugs (3P15A cord) for connecting battery and ground to test sets when test battery and ground jacks are provided.

2.07 Patching cord, W2M cord, 9 feet long, equipped with a 310 plug, two 59 cord tips (2W12A cord), and two 108 (rubber insulated) cord tips (installed locally on 59 cord tips) for battery and ground connections to test sets when battery is picked up at 35-type fuse, not to exceed 3 amperes, and frame ground or test battery and ground block.

2.08 Patching cord, P3H cord, 10 feet long, equipped with a 310 plug and a 240A plug (3P2A cord).

2.09 Patching cord, P4K cord, 12 feet long, equipped with a 289B plug and a 240B plug (4P4A cord).

2.10 Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord), one 365 tool, and one 419A tool.

2.11 477A tools or 258C make-busy tools, as required.

2.12 Blocking and insulating tools, as required. Use tools and apply, as covered in Section 069-020-801.

TABLE A

	APPARATUS	TESTS			
		A	B	C	D
2.02	Test Set (2.02)	1	1	—	—
2.03	Test Set (2.03)	1	—	1	—
2.04	Test Set (2.04)	—	—	—	1
	Head Telephone Set (2.05)	1	1	1	—
	Patching Cord (2.06)	1	1	1	—
	Patching Cord (2.07)	1	1	1	—
	Patching Cord (2.08)	1	1	—	—
	Patching Cord (2.09)	—	—	1	—
	Testing Cord (2.10)	—	—	—	1
	Make-Busy Tool (2.11)	1	2	2	—

3. PREPARATION

STEP	ACTION	VERIFICATION
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Tests A, B, and C

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|---|--|--|
| 1 | At relay rack —
At test set —
Set all keys to normal position. | |
| 2 | Insert 310 plug of battery cord into BAT G jack. | |
| 3 | Connect other end of battery cord to battery and ground supply. | |

Note: When using fuse or test battery, connect red (sleeve) conductor of W2M cord to frame ground and white (tip) conductor to equipment side of a convenient fuse.

Caution: To avoid possible grounding of the battery supply lead, connect the cord to the test set first. When disconnecting, remove cord from test set last.

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| 4 | Connect head telephone set to test set TEL jacks. | |
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4. METHOD

STEP	ACTION	VERIFICATION
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A. Local Selectors

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| 5 | Insert 310 plug of P3H cord into test set T jack. | |
| 6a | If using test set SD-90210-01 —
Operate SD key. | |
| 7b | It test is one where first trunk is made busy on level under test —
Invert 240A plug of P3H cord and insert into test jack of idle selector on same shelf as selector under test so that tip and ring of plug make contact with ring and tip of test jack. | |
| 8b | Operate LP key. | |

Dial tone heard on first selectors.

Note: Dial tone not heard if first selector is associated with common control or TOUCH-TONE equipment.

SECTION 226-305-503

STEP	ACTION	VERIFICATION
9b	Dial level under test.	Selector steps to level dialed, rotates to first terminal, and cuts through. Dial tone removed.
10b	Insert make-busy tool between sleeve and ground springs 3, 4 of selector test jack.	
11b	Remove 240A plug from selector test jack.	Selector held by make-busy tool.
12b	Restore LP key.	
13c	If testing SD-32183-01 selectors — Using a toothpick, insulate auxiliary test jack springs 5, 6.	
14	Insert 240A plug of P3H cord into test jack of idle selector.	BSY lamp not lighted.
15	Operate LP key.	BSY lamp lights. Dial tone heard on first selectors. <i>Note:</i> Dial tone not heard if first selector is associated with common control or TOUCH-TONE equipment.
16d	If selector is arranged to absorb first digit on all levels — Dial any digit.	Selector steps to level dialed and releases. Dial tone removed.
17e	If selector is arranged to absorb digits repeatedly on certain levels — Dial level so arranged at least twice.	Selector steps to level dialed and releases after each series of pulses. Dial tone removed after first series of pulses.
18f	If selector is arranged to block on certain levels — Dial level so arranged.	Selector steps to level dialed and blocks. Interrupted tone heard.
19f	Momentarily restore LP key.	Selector releases. BSY lamp extinguishes.
20	Dial level under test.	Selector steps to level dialed and rotates to first idle trunk. Dial tone removed.
21	Dial another digit.	No vertical kick of shaft.
22	Restore LP key.	Selector releases. BSY lamp extinguishes.
23	Operate LK key.	

STEP	ACTION	VERIFICATION
24	Repeat Steps 16 through 21, as required.	
25	Restore LK key.	Selector releases. BSY lamp extinguishes.
26	Remove 240A plug from selector test jack.	
27c	If testing SD-32183-01 selectors — Remove insulating tool from auxiliary test jack springs.	
28	Repeat Steps 13c through 27c, as required, on other selectors to be tested.	
	<i>Note:</i> If test is one where first trunk is made busy on level under test, substitute another selector previously tested for the one to hold first trunk busy and repeat Steps 7b through 27c on this selector.	
29g	If no further tests are to be made — Remove all cords and restore all keys.	
30b	If test is one where first trunk is made busy on level under test — Remove make-busy tool.	
B. Toll Selectors Using Test Set SD-90210-01		
5a	If test is one where first trunk is made busy on level under test — Insert make-busy tool between springs 3, 4 of test jack of idle selector on same shelf as selector under test.	
6a	Insert make-busy tool between springs 1, 2.	
7a	Remove and reinsert make-busy tool between springs 1, 2 intermittently to step selector to level under test.	Selector steps to level under test and rotates to first terminal.
	<i>Caution: To avoid personal contact with make-busy tool used to step selector, one end of tool should be insulated with tape or suitable material.</i>	
8a	When selector reaches level under test — Leave both make-busy tools in test jacks.	Selector holds in this position.
9	Insert 310 plug of P3H cord into test set T jack.	

SECTION 226-305-503

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| 10 | Insert 240A plug of P3H cord into test jack of idle selector under test. | If selector is arranged to supply dial tone to originating operator —
Dial tone heard. |
| 11 | Operate SD key. | Dial tone removed. |
| 12 | Operate LK key. | BSY lamp lights. |
| 13b | If selector is arranged to absorb first digit on all levels —
Dial any level. | Selector steps to level dialed and releases. |
| 14c | If selector is arranged to absorb digits repeatedly on certain levels —
Dial level so arranged at least twice. | Selector steps to level dialed and releases after each series of pulses. |
| 15d | If selector is arranged to block on certain levels —
Dial level so arranged. | Selector steps to level dialed and blocks.
Interrupted tone heard. |
| 16d | Momentarily restore LK key. | Selector releases. |
| 17 | Dial level under test. | Selector steps to level dialed, rotates past first terminal if made busy, and stops on an idle terminal. |
| 18 | Dial another digit. | No vertical kick of shaft. |
| 19 | Restore LK key. | Selector releases. |
| 20 | Operate LP key. | |
| 21 | Repeat Steps 13b through 18. | |
| 22 | Restore LP key. | Selector releases. |
| 23 | Remove 240A plug from selector test jack. | |
| 24 | Repeat Steps 10 through 23, as required, on other selectors to be tested. | |
| | Note: If test is one where first trunk is made busy on level under test, substitute another selector previously tested for the one to hold first trunk busy and repeat Steps 5a through 23 for this selector. | |
| 25e | If no further tests are to be made —
Remove all cords and restore all keys. | |
| 26a | If test is one where first trunk is made busy on level under test —
Remove make-busy tools. | |

STEP	ACTION	VERIFICATION
C. Toll Selectors Using Test Set SD-90416-01		
5a	If test is one where first trunk is made busy on level under test — Insert make-busy tool between springs 3, 4 of test jack of idle selector on same shelf as selector under test.	
6a	Insert make-busy tool between springs 1, 2.	
7a	Remove and reinsert make-busy tools between springs 1, 2 intermittently to step selector to level under test.	Selector steps to level under test and rotates to first terminal.
	<i>Caution: To avoid personal contact with make-busy tool used to step selector, one end of tool should be insulated with tape or suitable material.</i>	
8a	When selector reaches level under test — Leave both make-busy tools in test jacks.	Selector holds in this position.
9	Operate SL key.	
10	Insert 289B plug of P4K cord into test set TT jack.	
11	Insert 240B plug of P4K cord into test jack of idle selector under test.	
12	Release SL key.	
13	Operate LP key.	
14b	If selector is arranged to absorb first digit on all levels — Dial any level.	Selector steps to level dialed and releases.
15c	If selector is arranged to absorb digits repeatedly on certain levels — Dial level so arranged at least twice.	Selector steps to level dialed and releases after each series of pulses.
16d	If selector is arranged to block on certain levels — Dial level so arranged.	Selector steps to level dialed and blocks. Interrupted tone heard.
17d	Momentarily restore LP key and operate SL key.	Selector releases.
18	Dial level under test.	Selector steps to level dialed, rotates past first terminal if made busy, and stops on an idle terminal.

SECTION 226-305-503

STEP	ACTION	VERIFICATION
19	Dial another digit.	No vertical kick of shaft.
20	Operate SL key.	BSY lamp lights.
21	Restore LP key.	Selector releases. BSY lamp extinguishes.
22	Restore SL key.	
23	Operate LK key.	
24	Repeat Steps 14b through 20.	
25	Restore LK key.	Selector releases. BSY lamp extinguishes.
26	Remove 240B plug from selector test jack.	
27	Repeat Steps 9 through 26, as required, on other selectors to be tested.	
	<i>Note:</i> If test is one where first trunk is made busy on level under test, substitute another selector previously tested for the one to hold first trunk busy and repeat Steps 5a through 26 for this selector.	
27e	If no further tests are to be made — Remove all cords and restore all keys.	
28a	If test is one where first trunk is made busy on level under test — Remove make-busy tools.	

D. Restricted Service and Class-of-Service Indication Features

1	Insert 240A plug of handset into test jack of idle selector under test.	
2	Operate cord switch to ON position and handset switch to TALK position.	Dial tone heard on first selectors. <i>Note:</i> Dial tone not heard if first selector is associated with common control or TOUCH-TONE equipment.
3a	If selector is arranged to restrict service on specified levels — Dial level arranged for restriction.	Selector steps to level dialed and rotates to eleventh rotary position. Dial tone removed. Interrupted tone heard.

STEP	ACTION	VERIFICATION
4b	If selector is arranged to restrict service on levels until first digit is absorbed — Dial any level not arranged for digit absorption.	Selector steps to level dialed and rotates to eleventh rotary position. Interrupted tone heard.
5b	Momentarily operate handset switch to MON position.	Selector releases.
6b	Dial level arranged for digit absorption.	Selector steps to level dialed and releases. Dial tone removed.
7b	Dial level selected in Step 4b.	Selector steps to level dialed and rotates to first idle terminal.
8c	If selector is arranged to restrict service on levels until first digit is absorbed and then on specified levels under control of fourth lead (A lead) from preceding switch — Connect 365 tool of 893 cord to selector frame ground.	
9c	Connect 419A tool of 893 cord to jack spring as follows — For Western Electric Company shelves, jack spring 6. For Automatic Electric Company shelves, jack spring 13.	
10c	Dial level arranged for restriction under control of fourth lead.	Selector steps to level dialed and rotates to eleventh rotary position. Interrupted tone heard.
11c	Momentarily operate handset switch to MON position.	Selector releases.
12c	Dial level arranged for digit absorption.	Selector steps to level dialed and releases. Dial tone removed.
13c	Dial level selected in Step 10c.	Selector steps to level dialed and rotates to eleventh rotary position. Interrupted tone heard.
14d	If selector is arranged to extend restricted service or class-of-service condition over fourth lead (A lead) to succeeding switch — Connect 893 cord as in Steps 8c, 9c.	

SECTION 226-305-503

STEP	ACTION	VERIFICATION
15d	Dial code () to direct selector to level so arranged and restricted level of succeeding switch.	Selector steps to level dialed, rotates to first idle terminal, and cuts through. When second digit is dialed — Appropriate indication received.
		<i>Note:</i> In some cases, it may be necessary to check at called position as the indication may not always be received by tester.
16	Remove 240A plug from selector test jack.	
17	Disconnect 893 cord from jack spring of selector.	
18	Repeat Steps 1 through 17, as required, on other selectors to be tested.	
19e	If no further tests are to be made — Remove all cords and restore all keys.	